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ABSTRACT

This study estimates the incidence, characteristics, and patterns of change over time of illiteracy in Morocco. The study compares the results from direct literacy assessment to the conventional methods of self-reported literacy. This effort has provided more detailed, objective information with which patterns of literacy skills in the country may be determined, and their relationship to other important social and economic behaviors and outcomes analyzed. It also examines more closely the reliability and validity of common proxy indicators used to estimate literacy rates and skill levels. Results show that Morocco has been able to halve its literacy rate during the last 30 years; however, large disparities remain between men and women and between urban and rural areas. Implications for methods of measuring literacy and for formulating policy to increase literacy are discussed. (EH)

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LSMS
Living Standards
Measurement Study
Working Paper No. 115

Changing Patterns of Illiteracy in Morocco

Assessment Methods Compared

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Changing Patterns of Illiteracy in Morocco

Assessment Methods Compared

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Changing Patterns of Illiteracy in Morocco

Assessment Methods Compared

Victor Lavy, Jennifer Spratt, and Nathalie Leboucher

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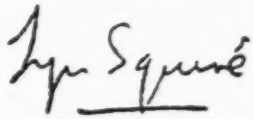
Foreword

Improving the quality of information on literacy and our understanding of its relationship to important social and economic behaviors and outcomes is essential for the design of policies and programs aimed at reducing illiteracy. While formal education remains a major source for the acquisition of literacy and related skills, government investments in education are shrinking in many countries, and the absolute number of persons believed to be illiterate is not declining. More detailed, accurate, and valid information on the incidence and characteristics of illiteracy is needed to help identify where the need for intervention is greatest, and to develop better methods for evaluating program effectiveness. This study is a step in this direction in the context of Morocco, where the incidence of illiteracy is still very high and the government is determined to adopt policy measures to reduce the illiteracy rate.



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Abstract

This study estimates the incidence, characteristics, and patterns of change over time of illiteracy in Morocco. The study compare the results from direct literacy assessment to the conventional methods of self-reported literacy. This effort has provided more detailed, objective information with which patterns of literacy skills in the country may be determined, and their relationship to other important social and economic behaviors and outcomes analyzed. It also provides an opportunity to examine more closely the reliability and validity of common proxy indicators used to estimate literacy rates and skill levels. The results have implications both for methods of measuring literacy and for formulating policy to increase literacy. Furthermore, these implications are relevant for any country attempting to measure and improve literacy.

Acknowledgments

This study was carried out with financial support from the MN1PHR and PRDPH divisions in the World Bank. Fieldwork for the study was conducted by Morocco's Direction de la Statistique, Ministere du Plan under the direction of Mr. Mohammed Abzahd, to whom we are indebted for his collaboration, help and insights throughout the fieldwork and analysis. We have also benefitted from reviews by the MN1PHR division in the Bank, in particular Mourad Ezzine who provided detailed written comments, and from the early collaboration of Daniel A. Wagner, University of Pennsylvania, and analyst Phillippe de Vreyer, formerly of the World Bank. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Bank.

I. Introduction

A country's adult literacy rate — the proportion of the adult population who can read and write — is a statistic that has been gathered from censuses and reported in collections of "development indicators" for decades. Viewed as an indicator of societal development and the human resources available in a country, it has been used to compare human resource development trends and levels across countries. At both national and international levels, it has been used as an explanatory variable in models of social and economic development, and as an output indicator of the quality and effectiveness of school systems.

And yet, existing national literacy statistics are acknowledged to be of dubious accuracy and comparability, and contain serious problems of definition, measurement, and interpretation. They reduce the concept of literacy to a dichotomous quality, despite the great range of skills and definitions that have been offered as constituting "literacy." They typically depend on a number of rather questionable implicit assumptions. For example, those who have attended school for a given number of years are assumed to be literate and to have experienced no attrition of skills in the years since leaving school, while those who have not been to school are generally assumed to be illiterate. Census-based statistics also tend to depend heavily on the assumption that household heads are capable of judging the literacy capabilities of other household members, even if they themselves are not literate.

Improving the quality of information on literacy and our understanding of its relationship to important social and economic behaviors and outcomes is essential for the design of policies and programs aimed at reducing illiteracy. While formal education remains a major source for the acquisition of literacy and related skills, government investments in education are shrinking in many countries, and the absolute number of persons believed to be illiterate is not declining. More detailed, accurate, and valid information on the incidence and characteristics of illiteracy is needed to help identify where the need for intervention is greatest, and to develop better methods for evaluating program effectiveness.

In response to this perceived need, and in contrast with conventional methods, the last decade has seen a push for the development of sample-based methods involving the direct measurement or assessment of skills of individual persons. Direct literacy assessments generally contain a series of tasks representing a range of reading, writing, and other skills, often incorporating items found in everyday activities. The individual's performance on each task is scored and a summary score, or a number of sub-scores, is calculated. This summary score or set of sub-scores may then be used in raw or standardized form, or evaluated against functional criteria for classification into discrete skill levels, as an alternative to conventional indicators of literacy. Examples of surveys of literacy and other skills employing direct literacy assessments include the National Assessment of Educational Progress (Kirsch and Jungeblut, 1986), the recent Canadian Survey of Literacy Skills Used in Daily Activities (Statistic Canada, 1991), and United Nations' Measuring Literacy Through Household Surveys (United Nations, 1989). A concise detailed presentation of direct assessment methods for survey use is available in Wagner (1990).

In Morocco, a direct literacy assessment module was designed and integrated into the National Survey on Household Living Standards (Ministry of Planning) in 1991-1992. The module, the Morocco Literacy Survey, was designed to collect information on literacy and other skills and knowledge of household members that are independent of common proxies for literacy competency such as self-report and educational attainment. This effort has provided more detailed, objective information with which patterns of literacy skills in the country may be determined, and their relationship to other important social and economic behaviors and outcomes analyzed. It also provides an opportunity to examine more closely the reliability and validity of common proxy indicators commonly used to estimate literacy rates and skill levels.

The methodology of data collection and construction of performance indices are discussed in Section II. In the descriptive analysis of survey results (Section III), we compare the distribution of illiteracy as based on conventional indicators against results using the direct skill measures provided in the literacy survey, across a number of population subgroups (gender, urban or rural residence, geographic region of residence, age cohort, and educational level). We also examine more closely the patterns of individuals' directly-assessed literacy skill levels across these stratifications. Section IV turns to an examination of the distribution of skills according to individuals' economic situation, as represented by household expenditure quintile and current employment status. Patterns of literacy skill levels and clues to the transmission of literacy within families are the subject of Section V, while Section VI presents a series of multivariate analyses of the determinants of illiteracy. Section VII offers a summary and discussion of the study findings.

II. Method

Instrument design[1]

The principal objectives of the Morocco Literacy Survey were (1) to examine in greater detail the range and variability of literacy skills and knowledge among individuals at the "low end" of the formal educational distribution in Morocco and (2) to provide independent indicators of basic education outcomes. Given these objectives, the assessments were designed to measure basic and intermediate literacy and numeracy skills. For this reason, we caution that they may provide little response variability at higher levels.

The Morocco Literacy Survey was designed to be suitable for administration to household members across the ages 9 to 69. Information collected includes self-reported mother tongue, educational experience, self-judgments on language-specific reading and writing abilities and on math abilities, reading and writing practice at home and at the work place, and availability of newspapers in the community. Those with formal educational experience ranging from none to a maximum of senior secondary schooling or the equivalent also received direct assessment measures of document familiarity, basic reading and writing skills in Arabic and French (when some French ability is reported), and mental and written math.[2] In addition, household heads and other adults age 20 to 50 received questions on basic health behaviors and services. The results of the direct assessments were used to produce separate scores for each skill or knowledge area.

The first draft of the survey, built upon prior literacy assessments created and used by the five-year Morocco Literacy Project (University of Pennsylvania and Universite Mohammed V; Daniel A. Wagner, P.I.), was prepared for pretesting in early August, 1990. All Arabic- and French-language materials, and the translation of all instructions to the respondent into Moroccan colloquial Arabic, were completed with locally hired assistants experienced in literacy survey work.

The full literacy survey consisted of the following nine sections: (1) general self-report questions on literacy skills and behaviors; (2) questions concerning basic health care behaviors (addressed to heads of households and their spouses, and other persons aged 20 to 50 only); (3) assessment of information location skills, using common literacy artifacts; (4) mental arithmetic assessment (two levels); (5) Arabic reading assessment (two levels), including word decoding, word-picture matching (level 1), and text comprehension (level 2); (6) Arabic writing assessment (two levels), including signature and word dictation (level 1) and sentence dictation (level 2); (7) French reading assessment (two levels, equivalent to Arabic reading assessment); (8) French writing assessment (two levels; equivalent to Arabic writing assessment); and (9) written numeracy assessments (two levels), including number recognition and writing (level 1) and solving of written equations (level 2).

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1. See the appendix for more details.

2. Results on the mathematics assessments will be discussed in a subsequent paper.

Words used in Arabic and French level-1 reading and writing tasks were selected from primary school textbooks currently in use in Morocco. Texts used in text-comprehension tasks were adapted from primary, secondary, and adult literacy textbooks and from local Moroccan newspaper articles. The information location task samples knowledge of literacy artifacts (letter envelope, newspaper, electricity bill, medicine label, national identity card) commonly found in Moroccan homes. Math problems, both oral and written, sample the basic arithmetic functions and concepts of measurement, percents, fractions, decimals, and plane geometry. Within each task, efforts were made to order items by increasing level of difficulty (for those tasks using school text content, according to their point of introduction in the curriculum); these orders were adjusted on the basis of piloting results.

Sample

The sample receiving the literacy module comprised a two-thirds sub-sample from the Morocco Living Standards Measurement Survey conducted in 1990-1991. The larger sample, stratified across the seven economic regions of Morocco, contained within each region 20 primary clusters of 24 households, with each primary cluster further divided into 3 secondary clusters of 8 households each. From this sample, 2 of the 3 secondary clusters in each primary cluster were targeted for inclusion in the literacy module sample, for a total expected sample size of 16 households (and all eligible household members) per primary cluster, or 2240 households nationally. When a target household or a majority of eligible individuals within a household could not be surveyed for any reason, a replacement household of similar size from the third secondary cluster in a given primary cluster was selected and surveyed. Table 1 presents the final sample of 2240 households and 8050 persons according to geographic region, gender, and urban or rural environment. Greater detail on overall sample structure and representativity is provided in documentation of the Morocco Living Standards Measurement Survey (1990-1991).

Construction of indices

The preparation of data for analysis required the construction of global indices of each competence domain, which combine the results of multiple levels of a given module into a more readily interpretable 3- or 4-point scale of competence levels. The indices may be interpreted as shown in Table 2. From these, overall indices of Arabic literacy (combining reading, writing, and document knowledge subscores), French literacy (combining reading and writing subscores), and math (combining mental and written math subscores) were also produced. The present paper, reporting on overall literacy abilities, makes use of a "global literacy" score, representing the respondent's highest demonstrated level of literacy (as defined by our indices) in either Arabic or French language.

Table 1. Description of the Sample

Region	*Households Sampled*	*Individuals Tested*		
		Total[a]	*Percent Male*	*Percent Urban*
North-West	320	1150	50.3%	56.0%
Central	320	1150	46.9%	62.1%
North-Central	320	1150	45.9%	35.8%
South-Central	320	1150	46.0%	47.8%
East	320	1150	46.6%	49.0%
South	320	1150	40.2%	31.9%
Tensift	320	1150	45.6%	35.5%
Total	2240	8050	47.2%	48.7%

Note: a. In absence of exact numbers of individuals tested, the average number of persons tested per household in each region is assumed to be 3.6 persons, roughly the national sample average of persons tested.

Table 2. Direct Literacy Assessments: Description of Scoring Levels

Test/Scoring Level	*Description of Level*
A. Tests of Reading (Arabic and French)	
Level 0	NO COMPETENCE DEMONSTRATED. The individual is unable to demonstrate ability to decode or comprehend simple written words
Level 1	RUDIMENTARY ABILITY. The individual demonstrates decoding and comprehension of single words, but has difficulty reading sentences or connected text with comprehension.
Level 2	MINIMAL COMPETENCE. The individual demonstrates ability to comprehend simple texts, although with some errors.
Level 3	COMPLETE FUNDAMENTAL COMPETENCE. The individual demonstrates ability to comprehend a variety of texts, including a newspaper article, without error.
B. Tests of Writing (Arabic and French)	
Level 0	NO COMPETENCE DEMONSTRATED. The individual is unable to demonstrate ability to write correctly a simple dictated word.
Level 1	RUDIMENTARY MINIMAL COMPETENCE. The individual demonstrates ability to write single words without difficulty, and complete sentences but with some errors.
Level 2	COMPLETE FUNDAMENTAL COMPETENCE. The individual demonstrates ability to write complete sentences without difficulty.

III. Patterns in the Incidence of Illiteracy, by Self-Report and Direct Testing Methods

To test the accuracy and convergent validity of conventional report-based indicators of literacy, we compared our directly-assessed competency scores with self-judgments of competency (Table 3). Through this analysis we hoped to identify non-random patterns in the measurement error of conventional methods, which may inform the development of optimally cost-effective hybrid methods combining the greater accuracy of direct assessment with the typically lower cost of conventional survey data.

In Table 3, the upper-left and lower-right quadrants roughly represent areas of "concordance" between the two approaches. According to conventional methods, the rate of illiteracy in all languages for our sample is 54.4 percent. On the other hand, the total illiteracy rate obtained by the direct method is 57.7 percent, 3.3 percentage points higher than the self-report-based estimate.

The underestimation of literacy skills by self-report was rare, but did occur. Of those who said that they could neither read nor write in any language, almost 97 percent obtained a score of 0 on the test, although 1.1 percent received a score of 2 or 3. Thus about 0.6 percent of the total sample seem to seriously underestimate their literacy skills; 0.4 percent placed themselves at the bottom of the skill distribution, while actually achieving the highest literacy score.

Misclassification is more prevalent in the direction of overestimation. Overall, 45.6 percent of those questioned say that they can read and write in one language. Of these, 51 percent indeed achieved a score of 3 on the test; however, 11 percent received a score of "0", and 17 percent received a score of "1" only (displaying only rudimentary skills), thus greatly overestimating their level of literacy. Indeed, 87% of those able to demonstrate only rudimentary reading and writing skills characterized themselves as "literate". In total, roughly 5 percent of the sample population stated that they were literate although they could demonstrate no literacy skills, while an additional 7.8 percent claiming literacy in fact had only very rudimentary skills. Comparisons of reading and writing levels in Arabic and French, and of numeracy skills, gave similar results.[3]

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3. Over 20 percent of persons demonstrating NO Arabic reading ability reported "fair" to "good" ability. Of those demonstrating only rudimentary skills, nearly 40 percent overestimated their skills, as "average" or "good", though there were very few underestimations. Of those with a basic skill level, 20 percent rated themselves as having "fair" skills only, while nearly 30 percent reported "good" skills, indicating a broad spread in individuals' self-characterization of skill level. Similarly, of those with strong demonstrated skills, over 8 percent characterized their skill as "fair" only. As for Arabic writing, a full 50 percent of persons able to demonstrate NO Arabic writing ability reported "fair" to "good" ability. The majority (62 percent) of those with only minimal writing skills characterized those skills as "good".

Self reports of French literacy abilities also varied from direct assessment results. Over 20 percent of persons who could demonstrate no French reading skills characterized these skills as "fair" to "good", while over 60 percent of persons able to demonstrate no French writing ability reported having "fair" to "good" skills. Persons able to demonstrate only rudimentary French skills were reasonably accurate and similar in their self-characterizations of both reading and writing skills, although about 19 percent could be said to have somewhat overestimated their reading skills as "average". Self-reports of persons demonstrating basic and strong French reading skill levels tend to be modestly estimated or even

Table 3. Comparison of Self-Reported and Directly Assessed Global Literacy

Self-Reported Global Literacy	*Direct Assessment Global Literacy Score*				
	0	*1*	*2*	*3*	*Total*
"ILLITERATE"	4238	92	16	32	4378
Row Percents	96.8%	2.1%	0.4%	0.7%	100.0%
Column Percents	91.2%	12.8%	2.1%	1.7%	54.4%
"LITERATE"	411	628	736	1887	3661
Row Percents	11.2%	17.2%	20.1%	51.5%	100.0%
Column Percents	8.8%	87.2%	97.9%	98.3%	45.5%
TOTAL	4648	720	752	1919	8050
Row Percents	57.7%	8.9%	9.3%	23.8%	100%
Column Percents	100%	100%	100%	100%	

The data presented in Table 3 also compel us to ask how closely self-reports of being "literate" match common interpretations of the literacy rate. By the direct assessment method used here, a score of 1 indicates only the most rudimentary abilities, generally at the single word level. Such a low level of skill (which characterizes nearly 9 percent of the present sample, and over 17 percent of those who considered themselves literate) seriously stretches most definitions of "literate" as intended or assumed by promoters of literacy rate statistics. In other words, apparently healthy "literacy rates" (as opposed to illiteracy rates) may in fact contain a high proportion of persons with very minimal literacy skills.

As we have seen, a substantial proportion of individuals sampled — roughly 13.5 percent — may be said to considerably over- or under-estimate their literacy skills. A closer analysis of the data permits us to determine whether these distortions appear across the population as a whole, or whether certain sub-groups are particularly susceptible to them. The information presented in Tables 4 though 7 begins to answer these questions across several dimensions of the population. Each table presents literacy statistics as estimated by both self-report and by the direct literacy assessment global score. The final column of each table, "Difference in Illiteracy Rates", shows the difference between the rate as calculated from individual self-reports of "illiteracy" (in both Arabic and French), and the proportion of the sample with directly-assessed

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underestimated, with over half of persons in each category responding in this manner.

Overestimation of arithmetic skills is even more pronounced. Sixty-four percent of those questioned claimed that they knew arithmetic. Of these 64 percent, only 32 percent achieved the maximum score of 2, while 39 percent received a score of 0. Worse, some 3.58 percent of those who gave a high rating to their arithmetic skills, failed to reveal even a minimal level of such skills. A full 50 percent of persons able to demonstrate no mental or written arithmetic skills reported "fair" to "good" ability. On the other hand, persons with some demonstrated arithmetic skills tended to be reasonably accurate in their self-characterizations.

skill level "0". A negative score indicates an under-estimation of the illiteracy rate when based on self-report relative to direct assessment, while a positive score indicates over-estimation of the rate by self-report.

Literacy levels by gender and environment

Self-reported and direct-assessment literacy estimates suggest significant differences by gender and urban or rural milieu (see Table 4). By self-report, the male illiteracy rate would appear to be 39 percent, while it reaches at least 44 percent by the direct assessment method, indicating an overestimation of 5 percent in conventional statistics. The distortion is less among females, with apparent literacy rates of 68.2 percent and 70 percent based on self-report and direct assessment respectively. In terms of the often-cited gender gap, the greater overestimation by males results in a gender gap that is 3 percentage points higher when based on self-report (29.2 points) than when based on direct assessment (26.0 points).

By both self-report and direct assessment, the difference in literacy levels between urban (35.6 to 37.5 percent) and rural (72.3 to 76.9 percent) environments is also very pronounced. According to self-report measures, the difference is about 37 percentage points between the two environments, while it is 39.4 percentage points by direct assessment. Both environments contribute to this discrepancy between the two methods, although self-report underestimation of illiteracy appears to be greater in the rural area.

Table 4. Direct and Self-Reported Literacy by Gender and Urban or Rural Environment (in percent of population group)

Population Group	*Self-Report "Illiterate"*	*Direct Literacy Assessment Level (Highest of Arabic or French)*			
		0	*1*	*2*	*3*
Total	54.4	57.7	8.9	9.4	23.8
Men	39.0	44.0	12.5	11.1	32.2
Women	68.2	70.0	5.7	7.9	16.3
Urban	35.6	37.5	8.7	12.7	40.9
Men	23.6	25.6	9.9	12.0	52.4
Women	46.7	48.5	7.7	13.3	30.3
Rural	72.3	76.9	9.1	6.3	7.5
Men	54.1	62.0	15.2	10.2	12.4
Women	88.2	89.9	3.8	2.9	3.3

Crossing gender with urban or rural milieu reveals a phenomenon with important methodological implications. Rural men, on the whole, appear to overestimate their literacy level substantially more than other groups. In our study, the illiteracy rate for rural men as estimated by self-report is nearly 8 points lower than by direct assessment, while all other groups show discrepancies of only 2 points or less. In summary, data which rely solely on self-assessments may overstate the rural gender gap, and understate the urban-rural gap.[4]

Examining patterns of literacy level within environments on the basis of direct assessment measures, we find illiteracy levels of 25.6 percent among urban males, 48.5 percent among urban females, 62 percent among rural males, and nearly 90 percent among rural females. At the other end of the literacy assessment scale, over 52 percent of urban males were found to have solid fundamental competence, followed by 30.3 percent of urban females. As would be expected, this level of skill is much less prevalent in rural areas, where it was obtained by 12.4 percent of males and only 3.3 percent of females.

Literacy and illiteracy by geographic region

Apart from the dramatic rural/urban differential discussed above, the geographical distribution of illiteracy in Morocco suggests relatively minor regional disparities (Table 5). The disparities in literacy across regions are most pronounced when evaluated using direct assessment measures. The gap between the highest- and lowest-ranking regions is 15 percentage points, compared to a gap of 13 percentage points using the self-reported literacy measure. The regions with the lowest rates of illiteracy are the Central region (51 percent), the North-West region (56 percent), the East region (57 percent) and the South-Central region (58 percent). The highest rates of illiteracy are found in the North Central (65.5 percent), Tensift (64.0 percent), and South (63.3 percent).

The illiteracy gender gap shows greater variability across regions. According to direct assessment, it is highest in the South (37.4 points), and lowest in the Tensift (20.9 points) and North-West (21.6 points) regions.

The ranking of regions by illiteracy rates according to self-report is identical to ranking by direct assessment-based rates, although the percentages are somewhat different. North-West and East regions display the highest propensity for over-estimation of literacy ability; for both

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4. This finding may be to some extent the result of selective rural-to-urban migration. If the flow is intensive in skilled and trained male workers, it will lead to a higher rural illiteracy rate and to a smaller gender gap. To address this question we examined the skill composition of migrants, using data from the migration section of the Morocco LSMS survey. Almost 30% of the urban sample are migrants from rural areas, about half of them migrated at age 14 or older. The sample suggests very little migration from urban to rural areas, with just 2.5% of the rural sample being migrants from urban areas. Rural to urban migrants are also slightly more literate than the rural population as a whole: the self-reported illiteracy rate among these migrants was 65% compared to 72% in the rural sample. These results suggest that the literacy gap found between urban and rural areas is indeed at least partially due to the selective rural-to-urban migration of more literate adults. Migration patterns also appear to narrow the observed literacy gap between men and women in rural areas, due to the higher proportion of migration by men than by women.

Table 5. Direct and Self-Reported Literacy by Geographic Region (in percent of each region)

Geographic Region	*Self-Report "Illiterate"*	*Direct Literacy Assessment Level (Highest of Arabic or French)*			
		0	*1*	*2*	*3*
TOTAL	54.4	57.7	8.9	9.4	23.8
South	60.8	63.3	11.5	7.4	17.7
Tensift	63.1	64.0	9.9	8.4	17.6
Central	50.3	50.6	8.8	13.8	26.5
North-West	51.8	55.5	10.7	8.8	24.8
North-Central	64.3	65.5	6.6	5.3	22.5
East	53.0	56.7	9.1	10.8	23.3
South-Central	55.5	58.0	8.1	7.5	26.2
MEN	39.0	44.0	12.5	11.1	32.2
South	34.9	40.9	19.1	10.7	29.1
Tensift	51.8	52.6	14.5	9.1	23.5
Central	37.4	38.2	10.7	15.3	35.6
North-West	38.9	44.8	13.6	10.3	31.1
North-Central	49.5	51.7	9.8	8.3	29.1
East	36.4	42.2	14.3	12.0	31.4
South-Central	38.0	42.1	11.2	10.4	36.1
WOMEN	68.2	70.0	5.7	7.9	16.3
South	78.3	78.3	6.4	5.1	10.0
Tensift	72.5	73.5	6.0	7.7	12.6
Central	63.1	62.9	7.0	12.3	17.6
North-West	64.9	66.4	7.7	7.3	18.4
North-Central	76.7	76.3	3.9	2.8	16.8
East	67.4	69.3	4.5	9.8	16.2
South-Central	70.5	71.6	5.3	5.1	17.8

regions the illiteracy rate when based on self-report is 3.7 percentage points lower than when it is based on direct assessment scores. Stratification by gender reveals that the major source of over-statement of literacy abilities in these regions and in two others (Tensift and South Central) is again males, whose self-reports of illiteracy in these regions range from 4.1 percent (South-Central) to roughly 6 percent (Tensift, North-West, and East) lower than direct assessments indicate.

We cannot provide here a complete explanation as to why the patterns of illiteracy found across regions exist, although some insight can be gained by examining regional differences in

income levels, schooling, and age structures. The regional distribution of mean per capita expenditure ranks the North-West and Central regions as the richest in the country, which accords with their national ranking in terms of literacy. These two regions also lead the others in terms of mean years of schooling among their adult population (4.9 and 4.7 years for the two regions, respectively, a co-factor which has a high positive correlation with literacy).

At the other extreme, the East region is nearly the poorest in the country, although its literacy rate is almost as high as that of the North-West region (where per capita expenditure is higher by more than 40 percent). Nonetheless, the East region's primary school enrollment rates are among the highest in the country (second only to the Central region), and its mean years of schooling among the 9-21 age group (5.2 years) is higher than the national average. Second, the region has the third highest share of urban residents in its population, a characteristic which is also highly correlated with literacy. Finally, the East region has the highest share of the 15-24 age cohort, which has the lowest illiteracy rate.

Change in literacy levels across age cohorts

Table 6 provides a snapshot of literacy skill levels by age cohorts. The relationship between age and illiteracy has a U shape: the age-specific illiteracy rate displays a decline until age 24 and then increases. The distribution by age of the 'best' group (score=3) has an inverse shape, increasing until age 24 and then declining. It is clear that the 15-24 age cohort has the best literacy skills: it has the lowest illiteracy rate (40 percent), while the 55+ age group has the highest rate, at 91 percent. The 15-24 age group also has the highest rate of individuals with the highest score of 3.

Comparing the first two columns of Table 6 reveals that self-report data provided by 9-to-14 year old is most likely to result in serious under-estimation of illiteracy. For this group, self-report data results in an illiteracy rate well over 12 percentage points lower than when the rate is estimated using direct assessment. The discrepancy is especially large for men (16 percentage points) and in rural areas (15 percentage points). Given that this age group is not included in most countries' definition of the adult population, a similar pattern of under-estimation by this group elsewhere would be unlikely to critically affect reported illiteracy rates. It should be noted however that Morocco, along with Somalia and some other countries *has* traditionally included persons aged 10 to 15 among their "adult" population in statistical reports. Conversely, though less markedly, illiteracy rates in older cohorts may be over-estimated when self-report is used, especially among women and urban dwellers. For these groups, over-estimations reaching nearly 5 points (females aged 25-34), over 6 points (urban dwellers aged 35-44) and as much as 10 points (urban dwellers aged 25-34) are observed.

The age-cohort results may be used to draw some tentative conclusions regarding historical trends in literacy in Morocco. Excluding the youngest cohort (aged 9-14), most of whom are still in primary school and likely to be still developing basic literacy skills, the data show a sharp reduction in illiteracy rates from older to younger cohorts. The total sample illiteracy rate based on direct assessment drops 51 percentage points, from 91.3 percent among

Table 6. Direct and Self-Reported Literacy by Age Cohort (in percent of each cohort)

Age Cohort	*Self-Report "Illiterate"*	*Direct Literacy Assessment Level (Highest of Arabic or French)*			
		0	*1*	*2*	*3*
TOTAL	54.4	57.7	8.9	9.4	23.8
9 to 14	34.0	46.6	16.5	17.8	19.2
15 to 24	40.1	40.3	9.1	12.2	38.4
25 to 34	63.3	59.5	7.1	7.7	25.8
35 to 44	63.6	61.3	9.8	7.4	21.6
45 to 54	85.0	86.1	4.2	1.6	8.2
55 and above	89.9	91.3	4.3	1.0	3.4
MEN	39.0	44.0	12.5	11.1	32.2
9 to 14	22.3	38.4	19.9	19.3	21.4
15 to 24	25.6	26.2	12.4	12.5	49.0
25 to 34	44.9	42.2	10.4	11.1	36.4
35 to 44	45.8	41.9	12.4	10.7	35.0
45 to 54	73.0	74.1	7.7	2.6	15.6
55 and above	79.3	82.2	8.9	2.0	6.9
WOMEN	68.2	70.0	5.7	7.9	16.3
9 to 14	45.7	53.8	13.0	16.3	16.9
15 to 24	53.1	52.8	6.1	12.0	29.1
25 to 34	79.4	74.6	4.3	4.7	16.5
35 to 44	79.4	74.6	4.3	4.7	16.5
45 to 54	94.8	95.9	1.2	0.7	2.1
55 and above	98.8	98.9	0.5	0.1	0.5
URBAN	35.6	37.5	8.7	12.7	40.9
9 to 14	8.8	18.5	16.2	29.8	35.4
15 to 24	17.9	14.3	7.6	15.5	62.6
25 to 34	49.8	39.7	8.3	8.6	43.4
35 to 44	51.0	44.6	12.5	9.2	33.7
45 to 54	79.6	76.8	4.1	2.9	16.2
55 and above	89.8	90.5	4.9	0.2	4.4
RURAL	72.3	76.9	9.1	6.3	7.5
9 to 14	53.5	68.3	16.7	8.5	6.5
15 to 24	63.5	67.6	10.6	8.8	13.0
25 to 34	77.8	80.7	5.9	6.6	6.8
35 to 44	78.7	80.7	5.9	6.6	6.8
45 to 54	89.6	94.0	4.2	0.5	1.4
55 and above	90.0	91.9	3.9	1.5	2.7

persons age 55 and above, to 40.3 percent of persons 15 to 24. Conversely, at the other end of the skill distribution, one observes higher frequencies for the younger cohorts. These patterns indicate a large improvement in average skill endowments among the Moroccan population in recent decades.

The drop in illiteracy rates from the oldest cohort to the age 15-24 cohort is considerably more dramatic among males (56 percentage points) than among females (46.1 points). This pattern suggests a disturbing increase in the gender gap in illiteracy over time: although important reductions in illiteracy have been made in both male and female cohorts, the rate of improvement has been higher among men.

We also notice from Table 6 that the pattern of reduction of the illiteracy rate is even more skewed toward the urban population. In urban areas, the rate of illiterates drops from 90.5 percent of the oldest cohort (age 55 and above) to only 14.3 percent of persons in the 15-24 age group, representing a phenomenal improvement of over 76 percentage points. In rural areas, however, the improvement between the two cohorts is only modest, with illiteracy dropping from 91.9 percent to 67.6 percent, a difference of only 24.3 points. In other words, the improvement in the urban sector has been roughly three times greater than in the rural sector. The possible role of increasing rural-to-urban migration in this phenomenon requires examination. In any case, the rapidly widening rural/urban gap in illiteracy rates may be taken as an alarming sign of relative neglect of development in rural Morocco, or more moderately, as a sign of relative lack of currency for literacy skills in that environment.

Literacy and education

The use of educational attainment and years of schooling as proxy measures for estimating literacy is a cornerstone of various statistical comparisons and indicators generated by UN agencies. Broadly speaking, for many developing countries any substantial gain in education attainment is seen as a major step toward reducing the incidence of illiteracy. The question to be examined here is the association between schooling attainment and the subjective and objective assessment of literacy in Morocco.

Morocco's official education system is composed of primary (6 grades), junior secondary (3 grades), senior secondary (3 grades), and university and other tertiary levels. The Baccalaureate examination is taken at the conclusion of secondary schooling, and is a prerequisite for all tertiary education. A parallel system of Quranic education, historically covering literacy and religious studies through the university level, has now been absorbed within the official system, in the form of higher-level specializations. Quranic preschools, however, still represent the principal form of pre-school education in Morocco.

Forty-eight percent of the sample have had no schooling (see Table 7). Of this group, more than two-thirds are women. An additional 37.6 percent have a level lower than or equal to complete primary schooling; only 3.4 percent have completed secondary schooling. Just over six percent of the sample have attended Quranic school (11 percent of men and 1.4 percent of

Table 7. Direct and Self-Reported Literacy by Educational Level (in percent of each educational subgroup)

	Percent of Sample Group	*Self-Report "Illiterate"*	*Direct Literacy Assessment Level (Highest of Arabic or French)*				*Difference in "Illiteracy" Rates*
			0	*1*	*2*	*3*	
TOTAL	100.0	54.4	57.7	8.9	9.4	23.8	-3.3
no schooling	47.9	98.4	98.7	0.8	0.0	0.0	-0.3
some primary	23.0	9.8	26.5	31.3	25.7	16.1	-16.7
complete primary	14.6	0.3	0.0	4.1	21.9	74.0	0.3
complete prep	5.0	0.0	0.0	2.0	2.0	96.0	0.0
Baccalaureate or equiv.[a]	3.4	—	—	—	—	(100.0)	—
QS 1 to 2 years	3.6	74.6	87.5	9.7	1.4	0.0	-12.9
QS 3 years or more[a]	2.5	56.2	40.0	36.0	12.0	12.0	16.2
MALES	100.0	39.0	44.0	12.5	11.1	32.2	-5.0
no schooling	29.9	96.5	97.3	2.3	0.0	0.0	-0.8
some primary	28.3	9.0	26.9	31.1	24.4	17.3	-17.9
complete primary	19.3	0.3	0.0	4.1	19.2	76.2	0.3
complete prep	6.7	0.0	0.0	0.0	4.5	95.5	0.0
Baccalaureate or equiv.[a]	4.4	—	—	—	—	(100.0)	—
QS 1 to 2 years	5.9	70.5	89.0	8.5	2.5	0.0	-18.5
QS 3 years or more[a]	5.1	56.0	47.1	35.3	7.8	9.8	8.9
FEMALES	100.0	68.2	70.0	5.7	7.9	16.3	-1.8
no schooling	63.9	99.2	99.5	0.2	0.2	0.0	-0.3
some primary	18.3	10.9	26.5	31.1	28.4	13.9	-15.6
complete primary	10.3	0.3	0.0	3.9	25.2	70.9	0.3
complete prep	3.5	0.0	0.0	0.0	2.9	97.1	0.0
Baccalaureate or equiv.[a]	2.5	—	—	—	—	(100.0)	—
QS 1 to 2 years	1.4	89.5	92.9	7.1	0.0	0.0	-3.4
QS 3 years or more[a]	0.0	—	—	—	—	—	—
URBAN	100.0	35.6	37.5	8.7	12.7	40.9	-1.9
no schooling	30.0	96.6	97.7	1.7	0.3	0.0	-1.1
some primary	26.5	7.6	20.0	28.3	30.9	20.4	-12.4
complete primary	23.5	0.2	0.0	2.6	18.3	78.7	0.2
complete prep	9.8	0.0	0.0	6.1	3.1	90.8	0.0
Baccalaureate or equiv.[a]	6.6	—	—	—	—	(100.0)	—
QS 1 to 2 years	2.3	78.0	87.0	8.7	4.3	0.0	-9.0
QS 3 years or more[a]	1.3	76.3	30.8	23.1	46.2	0.0	45.5
RURAL	100.0	72.3	76.9	9.1	6.3	7.5	-4.6
no schooling	64.8	99.2	99.2	0.5	0.0	0.0	0.0
some primary	19.6	12.5	35.2	34.7	19.4	10.7	-22.7
complete primary	6.0	0.7	0.0	8.3	35.0	56.7	0.7
complete prep	0.9	0.0	0.0	0.0	11.1	88.9	0.0
Baccalaureate or equiv.[a]	0.3	—	—	—	—	(100.0)	—
QS 1 to 2 years	4.6	72.8	91.3	6.5	2.2	0.0	-18.5
QS 3 years or more[a]	3.3	47.5	45.5	39.4	6.1	9.1	2.0

Note: a. Persons holding the Baccalaureate, equivalent diploma, or 11+ years of Quranic education were assumed to be literate at the highest level, and did not receive the direct literacy assessment.

women). Disparities between urban and rural environments are very pronounced, with nearly 65 percent of rural residents reporting no schooling as against 30 percent of urban residents. Nearly 40 percent of urban residents have completed primary school or higher, as compared to 7.2 percent of rural dwellers; 7 percent of urban residents have completed senior secondary, versus only 0.3 percent of rural residents. Stratification by gender further accentuates the disparities between milieux: 18 percent of urban men have had no schooling, as against 85 percent of rural women. Likewise, 8 percent of urban men have completed secondary education, as opposed to barely 0.01 percent of rural women.

The level of schooling also varies widely according to age group (not shown). Schooling participation has been growing steadily, with 33 percent of the 15-24 year old cohort reporting no schooling, in contrast with 87 percent of the 55+ age group. Eight percent of persons aged 25 to 34 reported passing the Baccalaureate, versus only 0.25 percent of the oldest age cohort. Dramatic changes can also be observed in the distribution or relative importance of secular versus religious schooling in Morocco. Although the small number of persons with Quranic education in the sample calls for caution in interpretation, the data also suggest that the share of individuals with Quranic schooling is declining continuously, from 10 percent among the older cohort to only 4 percent of the younger cohort. The decline in the urban sector is most dramatic, from 8.9 percent in the 55+ age group to 0.7 percent in the youngest cohort, with the sharpest drop occurring between the 25-34 age group (5.3 percent) and the 15-24 age group (1 percent). The decline in the rural sector is much more moderate, from 11.5 percent to 7.6 percent.

Turning to an examination of the relationship of literacy assessments to type and level of schooling, illiteracy rates of persons with incomplete primary or under 3 years of Quranic schooling would appear to be most at risk of under-estimation if self-report is used. For both of these groups, underestimations of over 12 percentage points are observed in the sample as a whole, and reach 18 percent or more among men and in the rural sample. Under-estimation of literacy skills (and therefore over-estimation of the illiteracy rate) is most prevalent among urban-dwelling persons with several years of schooling in the Islamic system. Of this group, 76.3 percent claimed no literacy skills, although only 52.9 percent obtained a score of "0" or "1" on the direct assessment measures.

When we consider educational level as a proxy for estimating literacy and illiteracy rates, there would appear to be little risk in the assumption that persons reporting no schooling have very little or no reading or writing ability. Fewer than 1 percent of persons with no schooling were able to demonstrate literacy skills at any level.

Among those with schooling, conversely, persons reporting at least complete primary education were able to demonstrate some level of literacy competence. No individuals in this category or higher received a score of "0" by direct assessment. Whether only rudimentary skills (level "1") should be considered "literacy" may be disputed, however; it should be noted that 3.5 percent of persons with complete primary education but no further schooling fell into this category. A more serious problem is the common assumption of illiteracy, and a resulting over-estimation of the illiteracy rate, among persons with incomplete primary education. Of such

persons in the current sample, over 42 percent were able to achieve direct assessment scores indicating a basic (level "2") to strong (level "3") command of literacy skills.

Regarding potential effects of the type of schooling attended, the data suggest that for persons with equal numbers of completed years of schooling, those who have studied in secular schools have a lower incidence of illiteracy than those who have studied for the same length of time at a Quranic school.[5] Among those with 3 to 5 years of schooling, illiteracy rates were 18 percent for secular-schooled persons, versus 56 percent for those who had attended Quranic schools (not shown). The gap in illiteracy rates between students of secular and Quranic schools, conditioned on completed years of schooling, decreases with the level of education. Further, multivariate regression analysis (see section VI below) reveals that even after controlling for other factors such as age, gender, and environment, type of schooling continues to have a significant effect on literacy scores obtained.

5. Because few people attend Quranic schools, the sample contains relatively few observations from this group. Interpretations and conclusions drawn from analyses of this group must therefore be made with caution.

IV. Literacy, Illiteracy, and Economic Status

Literacy levels obtained by the direct assessment method correlate highly with the quintile of per capita household expenditure (Table 8). The overall illiteracy rate is as high as 77 percent for the poorest quintile, in contrast with only 34 percent for the richest quintile. The difference is greatest between the fourth and last quintiles, by nearly 18 percentage points.[6] The disparity across quintiles is most pronounced in the urban sector. Here the difference in illiteracy rates between the lowest and highest quintiles is 28 points, versus a difference of only 18 points in rural areas. Nonetheless, even the richest rural quintile has a higher illiteracy rate than the poorest urban quintile.[7]

Convergent results from many studies conducted in both developing and developed countries indicate positive relationships between various measures of human capital and labor force participation. Among the 15-69 year age cohorts in our sample, the mean labor force participation rate is 57.9 percent (82.6 percent for males, 36 percent for females, 47.5 percent in urban areas, and 68.0 percent in the rural sector). Of labor force participants, 94 percent (54 percent of total) were employed at the time of the survey while 6 percent were unemployed (3.2 percent of total).

Overall illiteracy rates for labor market participants and for the non-active population are almost identical, about 61 percent, but these rates vary significantly by gender and milieu of residence (see Table 9). For men the illiteracy rate among labor market participants is higher (roughly 50 percent) than that of the non-active (22 percent). More disturbing are the findings related to skill differences between active employed and unemployed groups. Within the labor force, it is the unemployed who are endowed with more skills. Their illiteracy rate is under 14 percent, while among the employed it is almost five times that rate, at 62 percent. Similarly, mean years of schooling among the unemployed reaches 11.3 years, much higher than that of the employed, at 3.7 years. These differences are most striking for men, both in urban and in rural areas. It is of interest to note the similarity among unemployed men in rural and urban areas: in both areas these their literacy rate is very low (6.9 percent in rural and 2.8 percent in urban) and their mean years of schooling very high (12.4 and 13.4, respectively).

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6. When distinction is made between Arabic and French (not shown), differences in literacy between the quintiles are more pronounced in French than in Arabic literacy.

7. If illiteracy rates are compared according to level of education and economic status (as represented by per capita household expenditure quintile), we find a far greater variability by education level than by expenditure level. Multivariate analyses presented in section VI indeed show a suppressed contribution of expenditure quintile when years of schooling is included in the model. Economic position may thus constitute a secondary determining factor in relation to the education level. However this assertion cannot be categorical, since education level itself also increases significantly with expenditure levels.

Table 8. Direct Literacy Assessment Levels by Household Expenditure Quintiles (in percent of each quintile)

Household Expenditure Quintile	*Direct Literacy Assessment Level (Highest of Arabic or French)*				*Total*
	0	*1*	*2*	*3*	
TOTAL	57.7	8.9	9.4	23.8	100
Quintile 1 (lowest)	77.0	8.9	6.5	7.4	100
Quintile 2	73.2	9.0	6.9	10.7	100
Quintile 3	64.2	9.7	9.4	16.5	100
Quintile 4	51.2	9.4	12.1	27.1	100
Quintile 5 (highest)	33.5	9.6	11.6	45.1	100
URBAN	37.5	8.7	12.7	40.9	100
Quintile 1 (lowest)	54.3	11.7	15.8	18.0	100
Quintile 2	55.6	8.5	11.4	24.3	100
Quintile 3	45.2	10.2	13.7	30.7	100
Quintile 4	38.3	9.1	14.3	38.1	100
Quintile 5 (highest)	25.5	9.1	12.0	53.2	100
RURAL	76.9	9.1	6.3	7.5	100
Quintile 1 (lowest)	84.8	8.0	3.3	3.7	100
Quintile 2	78.7	9.1	5.5	6.5	100
Quintile 3	76.4	9.4	6.6	7.4	100
Quintile 4	70.8	9.9	8.7	10.4	100
Quintile 5 (highest)	66.7	11.7	9.7	11.7	100

Table 9. Direct Literacy Assessment Levels by Activity Status, Gender, and Environment (persons aged 15-69, in percent of each quintile)

Household Expenditure Quintile	*Proportion of Sub-Group*	*Distribution by Direct Literacy Assessment Level (Highest of Arabic or French; each row sums to 100 percent)*			
		0	*1*	*2*	*3*
TOTAL	100.0	59.9	7.5	7.6	24.8
Active employed	54.5	61.7	8.9	7.8	21.4
Active unemployed	3.2	13.7	7.6	22.6	55.9
Inactive	42.2	61.2	5.7	6.1	26.8
MEN	100.0	44.8	11.0	9.2	34.8
Active employed	79.2	51.2	11.9	9.7	27.1
Active unemployed	3.4	13.0	7.2	17.3	62.3
Inactive	17.3	22.0	7.5	5.4	64.9
WOMEN	100.0	73.1	4.5	6.1	16.0
Active employed	33.0	83.7	2.7	3.9	9.6
Active unemployed	3.0	14.4	8.0	27.9	49.5
Inactive	64.0	70.4	5.3	6.3	17.8
URBAN	100.0	40.6	8.0	9.5	41.7
Active employed	42.3	35.2	10.0	10.4	44.1
Active unemployed	5.2	11.6	7.7	21.2	59.3
Inactive	52.4	47.8	4.7	7.7	38.1
RURAL	100.0	79.5	7.1	5.6	7.6
Active employed	66.8	78.5	8.3	6.1	6.9
Active unemployed	1.1	23.4	7.0	29.1	40.2
Inactive	31.9	83.5	4.7	3.6	8.0

V. Family Patterns of Literacy and Illiteracy

In most cases, the unit of analysis underlying the calculation of literacy and illiteracy rates is the individual. In other words, literacy is implicitly viewed as an individual resource which, if it is not directly possessed by an individual, is not otherwise readily available to him or her. Departing from that view, the development of methods to characterize literacy skills at the household level has been advocated as an efficient and potentially more valid way to evaluate the functional distribution of literacy in societies in which the family unit, rather than the individual, is the principal functional unit, wherein the skills and resources of each member are pooled and available to all members. This general approach has gained further impetus with the development of household-survey methodologies applied to the domain of literacy, since the practical as well as statistical interdependencies of individuals within households are fundamental to the household survey approach. Here we present some preliminary analyses to demonstrate how patterns of literacy at the family level can be examined using household survey data.

Literacy levels of husband and wife

Table 10 presents a series of matrices which show the convergence of direct-assessment literacy levels of the head of household and spouse, for the total sample and for urban and rural sectors. In the country as a whole, there is a perfect match between skill levels of household head and spouse in 71 percent of households (the sum of the diagonal elements of Table 10). In the rural sector, both husband and wife are illiterate in almost four-fifths of households, suggesting that in the rural sector illiteracy could be referred to as a household-level problem. It is much less so in the urban sector, where the absolute lack of skills for both parents is observed in only 46 percent of households. Overall, there is greater inequality of skill distribution within urban households, relative to the almost perfect matching of parental skills in rural households.

Another interesting feature of Table 10 is revealed by the off-diagonal elements of the matrices. It is much more frequent to observe wives with more literate husbands (26.1 percent) than the opposite (3.2 percent); over 40 percent of the most literate husbands have an illiterate wife. In contrast, only a small fraction (less than 5 percent) of the most literate wives have an illiterate husband. Again, urban and rural households reveal somewhat different patterns. Six percent of urban wives are more literate than their partner, compared to fewer than 1 percent in the rural sector. We will return to the implications of these patterns in the discussion of inter-generational transmission of literacy.

If we adopt the assumption that illiteracy of both parents indicates an illiterate household, then the incidence of illiterate households is 63 percent in the whole country, 78 percent among rural households and 46 percent among urban households. These rates are very close to those obtained from the individual-level skill distribution, 77 percent and 38 percent for the two sectors, respectively. Can we therefore estimate adult illiteracy accurately by simply identifying illiterate households? This of course may be appropriate if inter-generational illiteracy rates are also highly positively correlated, a point to which we now turn.

Table 10. Family Literacy: Literacy Levels of Husband and Wife (in percent of each population group)

Direct Literacy Assessment Level of Wife	*Direct Literacy Assessment Level of Husband (Highest of Arabic or French)*				
	0	*1*	*2*	*3*	*Total*
TOTAL SAMPLE					
0	63.2	9.5	5.3	7.5	85.5
1	1.8	0.6	0.4	2.3	5.1
2	0.5	0.3	0.2	1.1	2.1
3	0.3	0.1	0.2	6.7	7.3
TOTAL	65.8	10.5	6.1	17.6	100.0
URBAN SAMPLE					
0	45.4	9.8	6.9	8.6	70.7
1	3.5	0.8	0.4	5.0	9.7
2	0.9	0.6	0.2	2.1	3.8
3	0.6	0.3	0.3	14.6	15.8
TOTAL	50.4	11.5	7.8	30.3	100.0
RURAL SAMPLE					
0	78.1	9.3	4.0	6.7	98.1
1	0.4	0.3	0.4	0.0	1.1
2	0.2	0.1	0.1	0.2	0.6
3	0.0	0.0	0.1	0.1	0.2
TOTAL	78.7	9.7	4.6	7.0	100.0

Table 10a. Comparison of Literacy Levels of Husband and Wife

Percent of Couples Which:	*Total Sample*	*Urban*	*Rural*
Husband and Wife Have Equivalent Literacy Levels	70.7	61.0	78.6
Husband Has Higher Literacy Level Than Wife	26.1	32.8	20.6
Wife Has Higher Literacy Level Than Husband	3.2	6.2	0.8

Literacy levels of parent and child

A comparison between the literacy levels of children (aged 9 to 21) in a given household with that of their parents is presented in Table 11. Overall, the percentage of illiterate persons is higher in the older generation. Nearly 5 out of 10 children (46.9 percent) whose parents are illiterate are also illiterate, compared to fewer than 2 out of 10 illiterate children (19.6 percent) in families in which both parents have some degree of literacy. In addition, nearly nine-tenths (88.0 percent) of all illiterate children come from households in which both parents are illiterate. Overcoming the reproduction of illiteracy in "illiterate" households may be an important dimension in the design and targeting of literacy programs.

Conversely, of the 11 percent of parents who obtained a maximum score of 3, two-thirds (66.4 percent) of their children have the same literacy rating. The off-diagonal elements of the matrix in Table 11 indicate that 47 percent of children have a higher literacy score than their parents, while only 9 percent of children have a lower skill level than their parents. The net gain of 38 percent from one generation to the next is positive and large.[8]

Table 11 also permits us to examine how this gain is distributed between urban and rural sectors. Urban literacy has dramatically improved from one generation to the next: the illiteracy rate has fallen from 65.2 percent to 13.2 percent. At the other extreme, 57 percent of urban children achieved the highest literacy score, compared to only 18 percent of the parents. Barely one-sixth (16 percent) of the urban children of illiterate parents are illiterate, while nearly 59 percent of these children attain the highest literacy score. Nonetheless, 22 percent of all urban illiterate children are the product of parents with some degree of literacy.

The situation is different in the rural milieu. Here we observe a much smaller decline in the illiteracy rate, from 86 percent to 67 percent from one generation to the next. Nearly 70 percent of rural children of illiterate parents are also illiterate; fewer than 9 percent obtained the highest literacy level. Ninety percent of all illiterate rural children have illiterate parents, and even in families in which one or both parents have some degree of literacy, over 47 percent of rural children are illiterate.

Mother's literacy and child's school attendance

Parental illiteracy can also affect the next generation through an influence on school participation. Two "school attendance" rates are examined: the rate of children aged 7 to 21 who have ever attended school, and the percentage of these same children who are at present attending school (see Table 12).

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8. Comparisons between boys and girls give very similar results, although the illiteracy rate among girls has declined less than among boys when compared to their parents' rate of illiteracy. Boys display higher literacy levels than their parents in 51.4 percent of cases, while this is true for girls in only 41.0 percent of cases. Girls in rural areas were found to have an especially low pattern of change, showing almost no gains over their parents in terms of literacy skills.

Table 11. Intergenerational Literacy Change: Comparing Parents' with Children's Literacy Levels (In percent of each population group)

Highest Direct Literacy Assessment Level of Parent	*Highest Direct Literacy Assessment Level of Child (Highest of Arabic or French)*				
	0	*1*	*2*	*3*	*Total*
TOTAL SAMPLE					
0	35.4	8.4	10.3	21.4	75.5
1	2.3	2.1	2.1	2.8	9.3
2	0.8	0.8	0.8	1.8	4.2
3	1.7	0.9	1.1	7.3	11.0
TOTAL	40.2	12.2	14.3	33.3	100.0
URBAN SAMPLE					
0	10.3	6.3	12.8	35.8	65.2
1	1.3	2.1	3.1	4.1	10.6
2	0.4	1.4	0.9	3.3	6.0
3	1.2	1.0	2.1	13.9	18.2
TOTAL	13.2	10.8	18.9	57.1	100.0
RURAL SAMPLE					
0	59.8	10.5	7.7	7.5	85.5
1	3.4	1.9	1.3	1.2	7.8
2	1.1	0.4	0.6	0.5	2.6
3	2.3	0.7	0.3	0.7	4.0
TOTAL	66.6	13.5	9.9	9.9	99.9

Table 11a. Comparison of Literacy Levels of Parents and Child

Percent of Families in Which:	*Total Sample*	*Urban*	*Rural*	*Male Child*	*Female Child*
Parent and Child Have Equivalent Literacy Levels	45.6	27.2	63.0	41.4	50.0
Parent Has Higher Literacy Level Than Child	7.6	7.4	8.2	6.9	8.7
Child Has Higher Literacy Level Than Parent	46.8	65.4	28.7	51.7	41.2

Seventy-four percent of the children aged between 7 and 21 years have attended school, while only 50 percent are presently attending school; these two percentages vary considerably according to the mother's literacy level. Ninety-six percent of the children of literate mothers have ever attended school, compared to only 72 percent of the children of illiterate mothers. Likewise, 89 percent of the children of literate mothers are presently attending school, compared to only 45 percent of the children of illiterate mothers.

When the results are differentiated according to age groups, we find that 100 percent of the 7- to 9-year-old whose mothers are literate have attended school, and all are currently attending school. In addition, over 90 percent of children aged 10 to 15 with literate mothers are currently attending school, 87 percent of children 16 to 18 years of age, and 61 percent of children aged 19 to 21. In contrast, the rate of current school attendance among children of illiterate mothers drops from 66 percent for 7 to 9 year-old to 37 percent for children aged 16 to 18 years, and to only 23 percent for 19 to 21 year-old.[9]

Table 12. Children's School Enrollment by Mother's Literacy (Children aged 7 to 21 years; percentage of each group in school)

Child's Enrollment and Age Group	*Percent of All Children in Age Group*	*Mother's Direct Assessment Score (Highest of Arabic or French Literacy)*	
		0	*1-2-3*
Children Who Have Ever Attended School	74.2	71.5	96.4
Age 7 to 9 years	70.0	68.2	100.0
Age 10 to 12 years	75.2	73.1	91.9
Age 13 to 15 years	73.7	70.2	97.9
Age 16 to 18 years	75.6	72.3	98.8
Age 19 to 21 years	72.8	71.1	96.1
Children Currently in School	50.1	45.4	89.1
Age 7 to 9 years	68.0	66.1	100.0
Age 10 to 12 years	65.0	61.7	91.9
Age 13 to 15 years	52.6	46.3	97.0
Age 16 to 18 years	42.8	36.5	86.9
Age 19 to 21 years	25.4	22.6	61.4

9. Parental reasons for not sending their children to school are revealed in a survey question on this topic. The most frequent reply (24 percent of all replies; 27 percent of urban and 23 percent of rural) cited disagreement with the methods of the school (e.g., coeducation) or with values transmitted by the school. The second most frequent reply (21 percent) cited household budgetary constraints, while the third most frequent reply (17.3 percent) raised the problem of accessibility: "no local school". Parents in the rural milieu were much more likely to refer to opportunity costs of the child's time and labor (10 percent of rural replies, versus 4 percent of replies in the urban milieu). On the other hand, urban parents were more likely to cite a lack of interest or perceived utility in schooling (15 percent of urban replies; versus 6 percent of rural replies). No parents surveyed indicated that their children were not accepted by a school due to lack of room or poor examination results.

VI. An Analysis of Literacy Determinants

The high degree of multi-collinearity among the various correlates of literacy indicates that we should move beyond looking at the bivariate correlations to a multivariate analysis. We present here a summary of regression analyses modeling the relationship between literacy and a set of co-factors (see Table 13). The basic regression equation has the following simple form:

$$Y = a + b1.X1 + b2.X2 + b3.X3 + b4.X4 + b5.X5 + e$$

where Y is the dependent variable (global literacy index), a is a constant, X1...X5 are the explanatory variables, b1...b5 are the parameters associated with the explanatory variables, and e the error. The potential explanatory variables considered in the models include age, gender, milieu, parents' literacy levels, quintile of household per capita expenditures, years and type of schooling, and some interaction terms. Since father's and mother's literacy are included as independent regressors, the sample analyzed includes only those individuals for whom valid literacy indices are available for both themselves and their parents. As a result of this restriction the sample excludes the older cohorts. All regressors are assumed to be exogenous.

The results shown in Table 13, Model 1 suggest that all regressors are significantly partially correlated with literacy. Age is negatively associated with both literacy and numeracy, confirming our earlier finding that illiteracy in Morocco has been declining. We have re-estimated the regressions of Table 13 stratifying the sample by urban and rural milieux. The age coefficients in the rural regressions are much lower than in urban regressions, again confirming our findings from Section IV that the trend of declining illiteracy rates in Morocco is much lower in rural areas.

Female gender is also negatively associated with literacy. Urban milieu appears to have a strong positive influence on the literacy level (t statistics over 20), as does parental literacy. The father's and mother's literacy have almost identical positive coefficients, and an F test could not reject the hypothesis that they are equal.[10] Finally, the quintile of expenditure is also strongly positively associated with literacy (the quintiles are coded from 1 to 5, from the poorest to the richest). All the estimated partial correlations reported in Table 13 confirm the findings reported in previous sections regarding the simple correlations between the various literacy indices and their correlates.

In a second set of regression equations (Table 13, Models 2 to 4), we added the level and type of education received as regressors. Education level was measured by total completed years of schooling. A dichotomous variable for education type, was coded "1" for the secular studies and "0" for Quranic studies. The fit of all the regressions improved significantly compared to the regressions reported in Model 1, by about 50 percent. The relative magnitude of results obtained previously for the effect of demographic and income variables was unchanged. However, the size of these coefficients was reduced significantly since years of schooling and

10. We also estimated a model with one variable for the literacy of the parents, calculated as the best score obtained by the father or the mother, for both literacy and numeracy. The results were not very different from those reported in Table 20.

Table 13. Determinants of Literacy Level

	Model 1		Model 2		Model 3		Model 4	
Predictor	*Beta*	*t-test*	*Beta*	*t-test*	*Beta*	*t-test*	*Beta*	*t-test*
Constant	2.77	38.7	0.45	7.2	0.6	11.3	0.41	2.2
Age	-0.02	25.6	-0.07	14.5	-0.006	12.8	0.001	2.0
Female gender	-0.55	21.9	-0.14	8.6	-0.14	8.3	-0.13	8.4
Urban milieu	0.59	20.7	0.19	10.2	0.17	9.1	0.13	7.0
Father's literacy	0.28	20.9	0.09	10.8	0.10	10.8	0.12	14.3
Mother's literacy	0.27	14.6	0.04	3.7	0.03	2.5	0.06	5.2
Expenditure quintile	0.08	7.9	0.01	1.4	0.005	0.8	0.004	0.6
Years of schooling			0.21	91.7	0.15	24.8	0.29	64.6
Secular schooling			0.23	6.1			0.11	3.0
Years of schooling x secular school					0.07	11.5		
Years of schooling x age							-0.002	20.3
R-square	0.46		0.79		0.79		0.80	
F	759.8		2462.8		2518.1		2402.1	
Number of observations	5402		5392		5392		5392	

type of schooling are highly correlated with the demographic and economic variables. The coefficient of mother's literacy declined more than that of father's literacy, indicating that mother's literacy is highly correlated with child schooling, more so than father's literacy.[11] However as a determinant of literacy level, conditioned on schooling, paternal literacy would appear overall to be the more important factor. More evidence on this question is revealed in regressions conducted separately for male and female subsamples (not shown). In both urban and rural areas, father's literacy is a significant determinant of the literacy level of sons but not of daughters. On the other hand, mother's literacy is significant for both boys and girls, although with larger and more significant coefficients in regressions on girls' literacy.

11. See Khandker, Lavy and Filmer (1993) for more evidence and discussion on the relationship between mother and father education and child schooling in Morocco.

The coefficient of expenditure declines drastically once years of schooling and type of education are included as determinants (Model 2), and its t value becomes nonsignificant. This finding suggests that available household resources affect literacy totally through schooling attainment and type of education.

Own years of schooling has a strong positive effect on literacy level, with a very high partial t value. The size of the coefficient (0.21) indicates that completing five years of schooling (equivalent to graduating from primary school before the 1990 change in the schooling system) leads to an increase in the literacy index of one level, for example from 0 to 1. To illustrate the impact of schooling on literacy levels, the model in Table 21 predicts that an eleven year old girl living in a rural household with illiterate parents and per capital expenditure at the lowest quintile, will score 1 in the literacy index if she has completed four years of secular schooling. To achieve level 3, the highest score in the literacy index, the same individual would need to complete almost 14 years of secular schooling. The policy implication of this result is that if compulsory schooling up to the completion of primary schooling were to be enforced nationwide, especially in rural ares, Morocco would move significant progress towards a complete eradication of illiteracy.

Secular schooling also contributes to higher literacy scores. More precisely, the impact of studying in a secular school rather than a Quranic school is to increase the predicted literacy index by 0.23, roughly equivalent to a full year of schooling. More detailed analyses (not shown) suggest that this effect is only relevant for males and is more pronounced in rural areas.

In Model 3 we present estimates that allow for the impact of the type of schooling acting through the effect of years of schooling. In order to achieve this we added an interaction term between years of schooling and the literacy index to the regression. The coefficients suggest that the effect of one year of secular schooling (0.22) is greater by almost 50 percent than that of a year of Quranic schooling (0.15). Using the previous example of the rural girl, only 3.3 years of secular studies is required to achieve level 1 in the literacy index, compared to 5 years of Quranic schooling. It follows from these results that the down-trend in the proportion of children enrolled in Quranic schools explains to some extent the decline in illiteracy in Morocco, especially in urban areas.

The positive effect of schooling on literacy should decline with age for at least two reasons: first, depreciation in the retention of skills acquired in school; second, and more importantly, a possible increase in the quality of schooling. In Model 4 we present the results of adding an interaction term between schooling and age to our basic regression. The coefficient of this term is indeed negative (with a very high t value), suggesting that the impact of schooling on literacy is sharply reduced with age. For example, the marginal contribution of one more year of schooling to the literacy score is 0.26 at age 20, but drops to 0.18 at age 60. We cannot identify however how much of this effect is accounted for by the increase in quality of schooling in Morocco.

VII. Summary, Conclusions, and Policy Implications

The results of the Morocco literacy module have implications both for methods of measuring literacy and for formulating policy to increase literacy. Furthermore, these implications are relevant for any country attempting to measure and improve literacy.

The most impressive result in the study was that Morocco has been able to halve its illiteracy rate during the last three decades. The current 15-24 age cohort has an illiteracy rate less than half of that of the 45-54 year old cohort. The trend is one of continuing improvement, since the evidence suggests that the 9-14 age cohort will have better skill endowment than the next older cohort.

The record of success is somewhat mixed however. On the basis of results from direct assessment methods, it would appear that the "gender gap", and the urban and rural disparities in literacy attainment in Morocco are much more critical than the gaps between regions. The gender "gap" in the illiteracy rate is still large, with a national average of 26 percent; worse still, it has been increasing over time. The gender literacy gap among the current younger generation is much larger than that of their grand-parents or even parents. The urban-rural disparity in literacy, is characterized by a similar trend. Indeed, cohort analysis suggests that urban-rural disparities in literacy have been widening over time, with urban areas showing a marked improvement, while rural areas have lagged far behind. Whether the phenomenon is due to selective out-migration of literate individuals from the countryside to towns, or to a crisis in educational access and quality in rural areas in particular, is a question with profound policy implications, and requires further examination.

Patterns of household-level literacy may hold some clue to the rural illiteracy problem. The vast majority of rural households are headed by parents both of whom are illiterate, while over 50 percent of urban households have at least one parent with some degree of literacy. Urban men are also more likely than rural men to marry a wife with a higher literacy level. Breaking down resistance to this pattern in rural areas may be one way to improve the proportion of households where at least one parent is literate. As it is, completely-illiterate parent are by far more likely to raise illiterate children.

On the whole, Moroccan secular education has improved the rates of literacy and numeracy skills in the population. Nonetheless, our study suggests that there are other routes to literacy in Morocco that are worth exploring. For example, 7 percent of those with no schooling in our sample demonstrated moderate literacy skills. At the other extreme, a small portion, though not negligible, of the "schooled" population would appear to have been poorly served by Morocco's educational system. Further studies to explain such counter-intuitive phenomena are warranted for identifying alternative and better targeted policy initiatives.

There are serious reservations concerning the literacy skills acquired in the Quranic education system. The low level of measured ability even in Arabic literacy casts serious doubt on the effectiveness of this education system in modern Morocco.

The strong positive causal effect of schooling on literacy estimated in this report suggests that increasing school enrollments and lowering dropout rates in rural areas are effective attractive policy options for reducing illiteracy rates of school age children. Our simulations suggest that the completion of primary schooling can guarantee rudimentary to minimal competence in writing and reading Arabic, as well as minimal ability to perform simple written calculations. The threshold of 5 to 6 years of schooling suggests that the government should enforce compulsory schooling at least up to the completion of primary schooling. The pattern of current school enrollment rates by region and gender in Morocco suggest that a policy priority should be the improvement of access to and quality of schooling in rural areas, with a special emphasis on girls.

The fact that literacy, while associated with higher household income and expenditure quintiles, was also associated with unemployment, is a sobering reminder of the challenge still facing Morocco and many developing countries to more fully mobilize the skills and potential of its increasingly literate and educated labor force. Literacy and education are for many a ticket to nowhere. The longer this phenomenon persists, the more likely a growing disillusionment with such skills will set in, with undoubtedly drastic long-term results.

However, at the same time, the evidence presented above suggests that the recent illiteracy campaign is not targeted at the most illiterate groups in the population. The government should refocus its literacy campaign and target the population in rural areas, particularly women in the North-West and North-Central regions.

With regard to the assessment and measurement of literacy, our results have suggested the presence of potential, though not always significant, patterns of bias in conventional methods of self-assessment. For Morocco, systematic patterns of over- and underestimation of literacy would appear to upwardly bias the literacy gap across genders, to mask or understate more serious disparities between urban and rural milieux and geographic regions and to account for lower-than-reported literacy levels among young people still in school. In short, the study revealed that about 7 percent of the population may be seriously misclassified (either as "literate" or "illiterate") when classification is based on self-assessment or educational level. These misclassifications may to some extent be systematic and it would not be sound to formulate policy based on them.

In summary, we believe that studies of the type represented by the Morocco Literacy Survey can contribute to more accurate and better-informed policy prioritization and development in the adult literacy field. The findings reported here for example, have highlighted patterns in the distribution of literacy in Morocco that depart from conventionally accepted figures, in some cases quite radically.

Appendix: Survey Design and Field Work

The battery of direct assessments included assessments of Arabic reading, Arabic writing, and an Arabic-language "Information Search" on a series of common documents; French reading, French writing; and mental and written arithmetic. Table A1 presents a summary of the structural and psychometric characteristics of these tests on the first month of data collection.

All test administration was individual, by data collectors specifically trained on these instruments. The assessments within any given category were designed with incremental skill levels. Administration of a particular assessment was governed by a series of criteria determining (a) at which level to begin a section of tests, given the individual's educational level or, in the case of French, self-report of ability, and (b) whether to proceed to a higher or lower level, on the basis of the individual's performance on the starting level. These "screens" were introduced to minimize time and maximize efficiency of administration; the average time required for a single administration was about 20 minutes.

The survey draft was subjected to pretesting, revision, full pilot testing, and a second revision prior to full-scale application in the field. Pretesting of the literacy survey was undertaken as a means of testing the adequacy of interviewer training and the efficiency of survey format and administration procedures. As such, it was intended to provide qualitative information for the finalization of methodology, rather than to allow detailed psychometric analyses (carried out in the later piloting phase).

Full-scale survey administration training took place over the course of two and one-half days in March 1991. In total 18 individuals participated, most of them seasoned survey-takers employed with the Statistics Direction of the Ministry of Planning. From this group two Adjoints-Technique and 8 survey-takers were selected.

Upon the completion of training, two teams of four survey-takers, one controller, and one supervisor each were deployed for survey piloting. The pilot study sample comprised three full primary clusters from the LSMS sample, each with 3 secondary clusters of 8 households apiece, for a total of 72 households. Analyses of data quality of the literacy survey pilot data file were also conducted, focusing on consistency checks across a selection of related variables. These included examinations of consistency across codings of the result of each interview and across educational level and last grade completed, and the consistency with which survey takers followed rules of exclusion, starting levels, passing to the higher level of a given submodule, and returning to the lower level.

Psychometric analyses of all assessment modules were performed, to examine the internal consistency of the modules, the reliability and difficulty level of individual items, and the equivalence of the two forms of each module.

With regard to internal consistency, coefficient alpha and split-half correlations were examined. With the exception of Module 2, "Connaissances de Base" and the French language modules (Modules 7 and 8, which had too few complete cases for reliable analyses), all tests were found to have acceptable internal consistency, with split-half correlations ranging from .7

to .9 and coefficient alphas in the .8 to .9 range. The low internal consistency of Module 2 suggests that this module samples discrete areas of familiarity or knowledge which may be analyzed, though with caution, at the individual item level.

Item reliability and difficulty indicators, in addition, were used to delete and re-order items. Modules revised in this way included Module 3, "Recherche-information," Module 4, "Calcul mental," and Module 9, "Calcul ecrit."

Form equivalency of Arabic and French reading and writing tests was examined using independent samples t-tests grouped by Form. Group means on all tests were found to have small and nonsignificant differences, with the exception of CTA ($t=2.06$, d.f. $=113$), for which Form B appears to be significantly less difficult than Form A. In subsequent ANCOVA analysis which controlled for age and grade level reached, Form was no longer significant on this task either ($F(1,109) = 2.43$).

Two teams of four trained interviewers and a supervisor were mobilized for this purpose for a period of 1.5 months each trimester, based on an estimated average of 4 household visits per interviewer per day, or 12 to 15 individual assessments per interviewer per day.

Because of the necessity to interview individually all household members between the ages of 10 and 69, survey teams tended to work on an afternoon-evening schedule, from about 2 pm to 10 pm each day in the field, making first contacts and interviewing all present household members in the afternoon, and making second (and when necessary third) visits to each household in the evening to interview school-goers and employed persons who were absent at the first visit.

Field teams were visited about twice each month by Direction Survey supervisors, and on four occasions by Professor Lavy or Dr. Spratt during the course of fieldwork. Interviewers were observed conducting surveys; and surveys previously completed by each interviewer were randomly selected and examined for procedural errors. While few significant departures from correct procedure were found, a group meeting with the team at the end of each visit was an occasion to review the rules of administration and timing of individual test sections.

The literacy survey was presented in a single sitting to each household member concerned. The self-report section (Module 1, "Questions Generales") was asked of every household member age 10 or older, providing some self-report information on literacy and numeracy abilities even for those individuals with higher levels of education who were excluded from the direct assessment portions of the survey. All heads of household, their spouses, and other household members between the ages of 20 and 50 inclusive and with less than Baccalaureate-level education, also receives Module 2, "Connaissances de Base," on knowledge of health behaviors and services.

Upon completion of the first month of fieldwork, data quality was again examined. Of 1304 individual cases available on computer, 1097 were found to constitute surveyed individuals.

On these cases, tests were run to identify out-of-range values, check the success of merging, check for data anomalies across logically related variables, and identify errors in test administration detectible by computer. Very few out-of-range values were detected, for the most part easily explained and corrected (e.g., inclusion of "signature" score in total of word-writing task; coding of "no" response by "0" rather than "2").

Psychometric analyses of instrument reliability was also conducted with the 1st month sample. The internal consistency and item analysis results indicated that the individual tests appear to be reasonably coherent, with most split-half correlations in the .85 to .95 range. Math test results were the least strong, but correlations were still reasonably high. T-test calculations of Form equivalence showed that for most assessments the two forms do not differ significantly. Three exceptions to this general finding include LOMA (word-decoding, Arabic), LOMF (word-decoding, French), and CMIF (word-picture matching, French). Given these tentative signs of non-equivalence, all tests were again evaluated for form equivalence upon the completion of data collection for the full sample, so that any persistent form differences could be statistically corrected *post facto* if necessary. With the full sample, significant differences across forms were no longer evident.

Table A1. List of Direct Literacy Assessments, with Psychometric Properties (Psychometric Test Results Based on First Month Survey, 1991)

TEST	FORM	N	ITEMS	MEAN	S.D.	RESPONSE RANGE	INTERNAL CONSISTENCY TESTS: SPLIT HALF CORR	SPEARMAN BROWN COEFF	COEFF ALPHA	MINIMUM ITEM/TOTAL CORR	FORM EQUIVALENCE: t value	p
A. TESTS OF ARABIC READING												
INFORMATION SEARCH	--	1030	12	4.644	4.904	0 - 12	0.953	0.976	0.966	0.818	---	
ORAL WORD READING	A	376	8	2.189	3.234	0 - 8	0.950	0.974	0.970	0.881	1.99	0.05
	B	382	8	2.673	3.451	0 - 8	0.946	0.972	0.973	0.843		
WORD-PICTURE MATCHING	A	376	8	1.830	2.852	0 - 8	0.884	0.938	0.946	0.801	1.39	n.s.
	B	379	8	2.127	2.914	0 - 8	0.867	0.929	0.934	0.796		
PARAGRAPH COMPREHENSION	A	215	12	9.324	3.211	0 - 12	0.808	0.894	0.886	0.611	0.19	n.s.
	B	205	12	9.332	3.615	0-12	0.882	0.937	0.922	0.556		
B. TESTS OF ARABIC WRITING												
ARABIC WORD-WRITING (dictation)	A	366	6	1.369	2.201	0 - 6	0.889	0.941	0.943	0.869	1.36	n.s.
	B	376	6	1.620	2.316	0 - 6	0.913	0.954	0.942	0.837		
ARABIC SENTENCE-WRITING (dictation)	A	201	3	5.453	1.131	0 - 6	*** too few items for consistency analysis ***				0.89	n.s.
	B	193	3	5.352	1.104	0 - 6	*** too few items for consistency analysis ***					

Table A1. (continued)

TEST	FORM	N	ITEMS	MEAN	S.D.	RESPONSE RANGE	INTERNAL CONSISTENCY TESTS: SPLIT HALF CORR	SPEARMAN BROWN COEFF	COEFF ALPHA	MINIMUM ITEM/TOTAL CORR	FORM EQUIVALENCE: t value	p
C. TESTS OF FRENCH READING												
ORAL WORD READING	A	165	8	5.345	3.078	0 - 8	0.906	0.951	0.934	0.816	2.45	0.02
	B	182	8	4.527	3.130	0 - 8	0.892	0.943	0.927	0.704		
WORD-PICTURE MATCHING	A	166	8	4.988	2.902	0 - 8	0.837	0.911	0.901	0.724	3.14	0.01
	B	180	8	3.983	3.029	0 - 8	0.831	0.907	0.908	0.677		
PARAGRAPH COMPREHENSION	A	147	12	7.517	3.539	0 - 12	0.857	0.923	0.890	0.603	0.96	n.s.
	B	120	12	7.950	3.732	0 - 12	0.892	0.943	0.904	0.539		
D. TESTS OF FRENCH WRITING												
FRENCH WORD-WRITING (dictation)	A	146	6	2.390	2.124	0 - 6	0.811	0.895	0.885	0.474	0.30	n.s.
	B	158	6	2.335	1.944	0 - 6	0.812	0.896	0.853	0.446		
FRENCH SENTENCE-WRITING (dictation)	A	92	3	4.467	1.579	0 - 6	*** too few items for consistency analysis ***				1.09	n.s.
	B	85	3	4.718	1.477	0 - 6	*** too few items for consistency analysis ***					

Figure A1. Direct Literacy Assessment Levels by Activity Status, Males

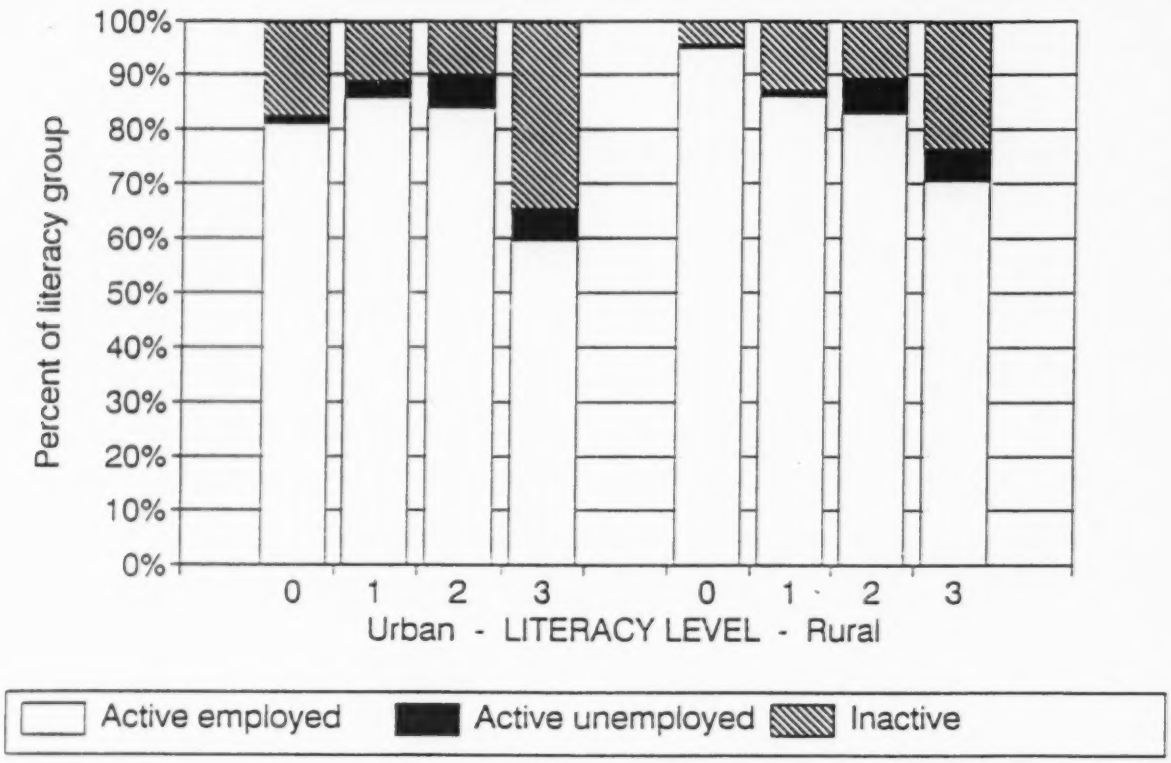
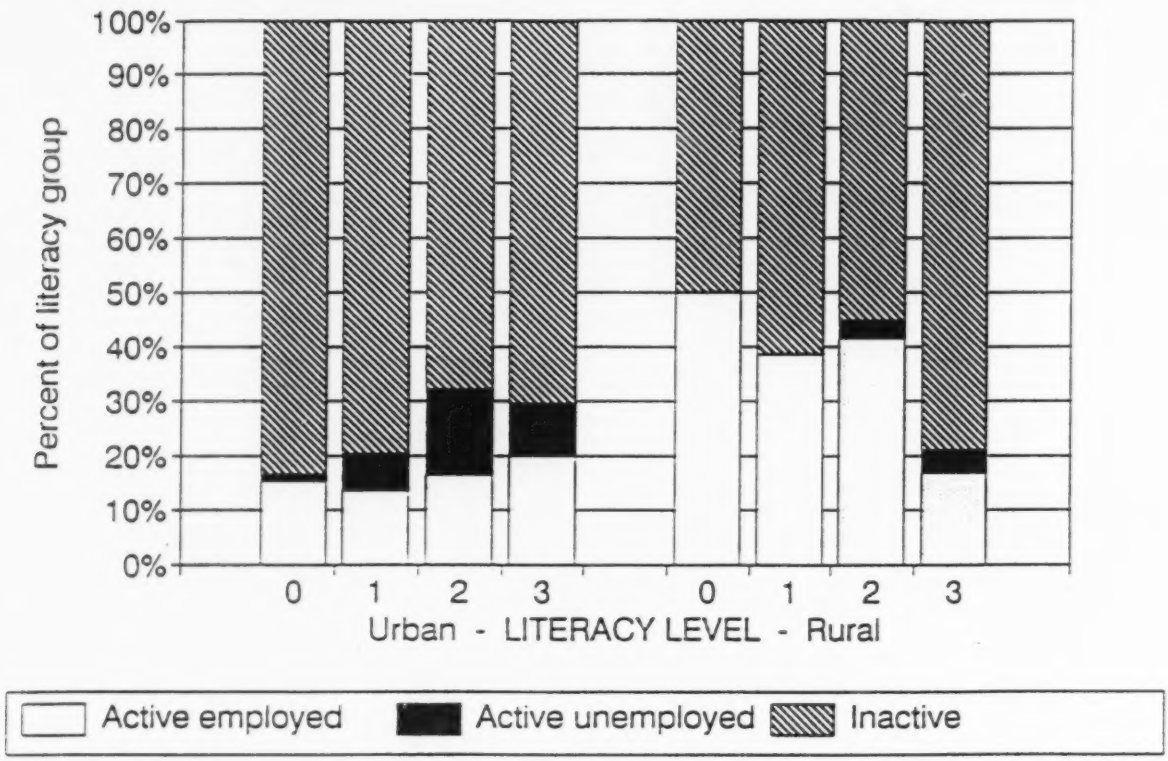


Figure A2. Direct Literacy Assessment Levels by Activity Status, Females



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